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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/029,478	12/20/2001	Richard Pederson	3123-394	5465

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EXAMINER

RODRIGUEZ, GLENDA P

ART UNIT PAPER NUMBER

2651

DATE MAILED: 04/21/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/029,478

Applicant(s)

PEDERSON ET AL.

Examiner

Glenda P. Rodriguez

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>3</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 8, 11, 12, 13-17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chang et al. (US Patent No. 6, 188, 531) in view of Meyer et al. (US Patent No. 5, 991, 113).

Regarding Claim 18, Chang et al. teaches a hard disk device, comprising:

A magnetic storage disk (Pat. No. 6, 188, 531; Fig. 4, Element 14);

A temperature transducer (Pat. No. 6, 188, 531; Fig. 4, Element 30.

Chang et al. teaches the use of a temperature sensor, which has the same scope as Applicant's description as explained in Page 9, Line 1-2 of the Specification);

A transducer head, comprising:

A write/read head (Pat. No. 6, 188, 531; Fig. 4, Element 12 and Col. 4, Lines 36-43. Chang et al. teaches a head that is attached to a read and write circuit, therefore, it is obvious to a person of ordinary skill in the art that if the head is attached to a read/write circuit, it performs read/write operations.);

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A preamplifier (Pat. No. 6, 188, 531; Fig. 14, Element 8), wherein an amount of current supplied to said write head during a write operation is adjusted for temperature and is less than an amount of current required to produce write induced instabilities in the head (Pat. No. 6, 188, 531; Col. 4, Line 52 to Col. 5, Line 67).

Chang et al. fail to teach wherein the temperature controlled in order to evade the pole to protrude from the transducer. However, this feature is well known in the art as disclosed by Meyer et al., wherein it teaches a method to control the fly height by sensing its temperature in the transducer head (Pat. No. 5, 991, 113; Col. 3, Lines 5-11, Lines 28-39, Lines 55-59, and Col. 3, Line 64 to Col. 4, Line 7. Meyer et al. teaches that the temperature is sensed in order to control the fly height and current in order to evade the pole tip to touch the disk.). It would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to modify Chang et al.'s invention in order to control the write head in order to prevent contact between the head and the disk.

Method claims 1, 12 and 15 are drawn to the method of using the corresponding apparatus claimed in claim 18. Therefore method claims 1, 12 and 15 correspond to apparatus claims 18 and are rejected for the same reasons of obviousness as used above.

Regarding Claim 2, Meyer et al. teach all the limitations of Claim 1. Meyer et al. fail to teach the sensed temperature to an algorithm to determine a current level adjustment for said at least the write current and write current boost. Chang et al.

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further teach applying the sensed temperature to an algorithm to determine a current level adjustment for said at least the write current and write current boost (Pat. No. 6, 188, 531; Col. 4, Line 52 to Col. 5, Line 67). It would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to modify Meyer et al.'s invention in order to control the current in the transducer head.

Regarding Claim 8, Chang et al. and Meyer et al. teach all the limitations of Claim 1. Meyer et al. further teach wherein at least one of a write current and a write current boost is less than an amount of current that would cause a transducer head pole to protrude an amount such that transducer head contacts the disk and is greater than an amount of current that would be insufficient to magnetize a desired volume of the disk (Pat. No. 5, 991, 113; Col. 4, Line 52 to Col. 5, Line 67). It would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to modify Meyer et al.'s invention in order to control the current in the transducer head.

Regarding Claim 11, Chang et al. and Meyer et al. teach all the limitations of Claim 1. Meyer et al. further teach wherein contact between said disk and pole due to pole tip protrusion is avoided (Pat. No. 5, 991, 113; Col. 3, Lines 5-11, Lines 28-39, Lines 55-59, and Col. 3, Line 64 to Col. 4, Line 7). It would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to modify Chang et al.'s invention in order to control the write head in order to prevent contact between the head and the disk.

Regarding Claims 13, 16 and 17, Chang et al. and Meyer et al. teach all the limitations of Claims 12 and 15, respectively. Chang et al. further teach wherein

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measuring the temperature of the disk drive, compensating at least one of nominal write current and write current boost and supplying at least one of the compensated write current and write current boost to the write head during a write operation (Pat. No. 6, 188, 531; Col. 4, Line 52 to Col. 5, Line 67).

Regarding Claim 14, Chang et al. and Meyer et al. teach all the limitations of Claim 13. Meyer et al. further wherein applying the measured temperature, wherein at least one of a write current and write current boost and applying at least one of a write current and a write current boost temperature compensation value to at least one of the nominal write current and write current boost (Pat. No. 5, 991, 113; Col. 3, Lines 5-11, Lines 28-39, Lines 55-59, and Col. 3, Line 64 to Col. 4, Line 7. Meyer et al. teaches that the temperature is sensed in order to supply a current that controls the head in which it evades the transducer to contact the disk.). It would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to modify Chang et al.'s invention in order to control the current in the disk in order to avoid head to disk contact.

Claims 3-7, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chang et al. and Meyer et al. as applied to claims 1 and 15 above, and further in view of Takahashi (US Patent No. 6, 101, 053).

Regarding Claims 3 and 19, Chang et al. and Meyer et al. teach all the limitation of Claims 1 and 18, respectively. Chang and Meyer et al. fail to teach wherein applying a sensed temperature to a table, wherein a value corresponding at least of the write current and said write current boost at said sensed temperature is obtained from the

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table (Pat. 6, 101, 053; Fig. 3 and Col. 6, Lines 9-54). It would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to modify Chang et al. and Meyer et al.'s invention in order to have the optimal current value according to the temperature.

Regarding Claims 4 and 5, Chang et al. and Meyer et al. teach all the limitation of Claim 1. Chang and Meyer et al. fail to teach wherein a sequence is written, read, verified for errors and decreasing a current to a second magnitude. However, this feature is well known in the art as disclosed by Takahashi, wherein it teaches the operation of writing data, reading the data and comparing it in order to find errors and adjusting the write current (Pat. No. 6, 101, 053; Fig. 8, Elements S1, S6, S9 and S10 and Col. 9, Line 60 to Col. 10, Line 63. Takahashi teaches a method of modifying the current throughout the ranges of 20 mA to 50 mA). It would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to modify Chang et al. and Meyer et al.'s invention in order to have the optimal current value according to the temperature.

Regarding Claims 6 and 7, Chang et al., Meyer et al. and Takahashi teach all the limitations of Claim 1, respectively. Takahashi further teaches that at least one of a write current and write current boost is increased/decreased. However, this feature is well known in the art as disclosed by Takahashi, wherein it teaches that the write current is calibrated between 20mA to 50mA according to the temperature (Pat. No. 6, 101, 053; Fig. 8, Elements S1, S6, S9 and S10 and Col. 9, Line 60 to Col. 10, Line 63). It would have been obvious to a person of ordinary skill in the art, at the time the

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invention was made, to modify Chang et al. and Meyer et al.'s invention in order to have the optimal current value according to the temperature.

Regarding Claim 20, Chang et al. and Meyer et al. teach all the limitations of Claim 18. Chang et al. and Meyer et al. fail to teach wherein further comprising a memory wherein at least one of the write current and write current boost is stored. However, this feature is known in the art as disclosed by Takahashi, wherein it discloses the use of a memory (Pat. No. 6, 101, 053; Fig. 1, Element 4 and Col. 6, Lines 9-18). It would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to modify Chang et al. and Meyer et al.'s invention in order to have the optimal current value according to the temperature.

Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meyer et al. as applied to claim 1 above, and further in view of DeGroat et al. (US Patent No. 6, 449, 110). Meyer et al. teach all the limitations of Claim 1. Meyer et al. fail to teach wherein a sequence is written, read, verified for errors (by position error or means square error) and decreasing a current. However, this feature is well known in the art as disclosed by DeGroat et al., wherein it teaches a method in which a test pattern is written, read and is verified if it surpasses a number of errors and adjusts the current if necessary (Pat. No. 6, 449, 110; Fig. 9). It would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to modify Chang et al. and Meyer et al.'s invention in order to prevent degradation of the signal (Pat. No. 6, 449, 110; See Abstract).

Conclusion


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The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Boutaghou et al. (US Patent No. 6, 501, 606).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Glenda P. Rodriguez whose telephone number is (703) 305-8411. The examiner can normally be reached on Monday thru Thursday: 7:00-5:00; alternate Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Hudspeth can be reached on (703) 308-4825. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


gpr
April 8, 2004.


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